

UNCLASSIFIED

AD NUMBER

ADB022599

LIMITATION CHANGES

TO:

Approved for public release; distribution is unlimited.

FROM:

Distribution authorized to U.S. Gov't. agencies only; Test and Evaluation; 14 JAN 1977. Other requests shall be referred to Electronic Systems Div., Hanscom AFB, MA 01731.

AUTHORITY

USAFGL ltr 7 Sep 1982

THIS PAGE IS UNCLASSIFIED

AD B022599

AUTHORITY: USAFGL

7/7/82 7 Sep 82



18 19
ESD TR-77-303



#10 2
Report No. 131500-604
14 January 1977

12 24p.

ADB022599

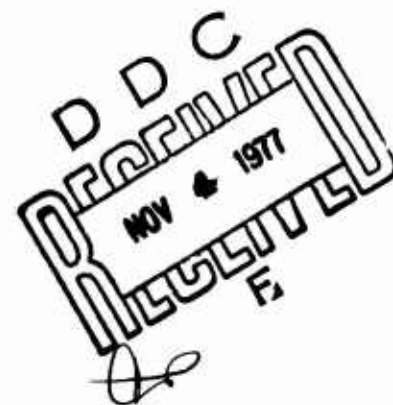
6
FIELD DEMONSTRATION TEST REPORT
FOR THE
AN/TRN-41 TACAN NAVIGATIONAL SET

Distribution limited to U. S. Government agencies only;
Reason: Test and Evaluation. 13 January 1977. Other
requests for this document must be referred to Department
of the Air Force, Headquarters Electronic Systems Division
(AFSC), Hanscom Air Force Base, Massachusetts 01731,
Attention: ~~PPG~~ DRI

Prepared for:
Department of the Air Force
Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base
Massachusetts 01731

Prepared by:
✓ E-Systems, Inc., Montek Division
2268 South 3270 West
Salt Lake City, Utah 84119

15
Contract No. F19628-75-C-0200
CDRL Item A00Y



AD NO. _____
DDC FILE COPY

408354

AB

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER ESD-TR-77-303	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Field Demonstration Test Report for the AN/TRN-41 TACAN Navigational Set		5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) NONE		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS E-Systems, Inc., Montek Division 2268 South 3270 West Salt Lake City, Utah 84119		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Electronic Systems Division (AFSC0 Hanscom AFB, Ma 01731		12. REPORT DATE 14 January 1977
		13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A
16. DISTRIBUTION STATEMENT (of this Report) Distribution limited to U.S. Government agencies only; Reason: Test and Evaluation. 13 January 1977. Other requests for this document must be referred to Department of the Air Force, Hq ESD (AFSC), Hanscom AFB, Ma 01731, Attention: DRI.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) AN/TRN-41 TACAN Navigational Set		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report describes the field demonstrations as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.		

FIELD DEMONSTRATION TEST REPORT
FOR THE
AN/TRN-41 TACAN NAVIGATIONAL SET

This report describes the field demonstrations as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41, 131500-415.

1. **Test Identification.** The demonstrations are divided into three groups: (a) air drop configuration, transportability and manportability demonstration; (b) assembly and installation and check list demonstration; and (c) safety and human engineering demonstration. These demonstrations are performed to meet the requirements of the Prime Item Development Specification for Navigational Set, TACAN, AN/TRN-41, Specification No. 404L-701-5017A, Part I of two parts.
2. **Functional Purpose.** These demonstrations from a part of the AN/TRN-41 qualification tests.
3. **Test Objectives.** To demonstrate that the AN/TRN-41 will meet the requirements of Specification No. 404L-701-5017A, Part I of two parts, dated 26 August 1976.
4. **Description of Test Article.** The AN/TRN-41 was used during the demonstrations. Also, the manportable and airdroppable packaging was used.
5. **Summary of Test Results.** Table 1 provides a summary of test results. The requirement tested is listed with the reference paragraph from 404L-701-5017A, Part I of two parts, the specification, the test procedure from the Equipment Test Plan, and a statement of results.
6. **Description of Test Facility and Procedure.** The test facilities and test procedures are described in Appendix VI of the Equipment Test Plan.
7. **Test Setup Diagrams.** No test setup diagrams were required. Description of tests are given in Appendix VI of the Equipment Test Plan.
8. **List of Equipment.** The only equipment used during the demonstrations other than the test articles was a standard military pack board, MIL-P-10941D.
9. **Recorded Test Data.** Attachment 1 is a copy of the completed data sheets for the demonstration tests. Attachment 2 contains photographs of the system in the airdroppable and manportable configurations. Attachment 3 contains a photograph showing the use of the check list for operation. Attachment 4 contains photographs showing the system prior to set up in an open location and the system set up in an open location.

<input type="checkbox"/>	<input checked="" type="checkbox"/>
E Section	E Section
DISTRIBUTION ABILITY CODES	
OF SPECIAL	
B	

TABLE 1. SUMMARY OF TEST RESULTS

Requirement	404L-701-5017A Paragraph No.	Specification	Equipment Test Plan Appendix VI Test	Results
Manportability	3.1.2.5	Each package in manportable configuration can be fastened to packboard.	Appendix VI-A	Fastened to packboard (see attachment 2)
Assembly and Installation	3.2.1.12	No more than 30 minutes set up by three men.	Appendix VI-B	15 minutes
Adjustments	3.2.1.13	No adjustments after placing in operation.	Appendix VI-B	No adjustments
Air Drop Configuration	3.2.2.6	All air drop packages can be placed in 66" x 29" x 48" space	Appendix VI-A	64" x 27" x 48"
Transportability	3.2.6	Convert from airdrop to manportable in 15 minutes by 3 men.	Appendix VI-A	3 min. max.
Safety	3.3.6	Meet requirements of MIL-STD-454, Requirement 1.	Appendix VI-C	All requirements met (see paragraph 11).
Human Engineering	3.3.7	Meet requirements of MIL-STD-1472	Appendix VI-C	All requirements met except for the following (see paragraph 11): a. RT ground lug difficult to tighten. b. All equipment difficult to carry in manportable configuration. c. Antenna and ancillary packages exceed specified weight.
Personnel Requirements	3.6.1	Operation within capability of one skill level	Appendix VI-A and VI-B	Set up by 3 men and operation by 1 man.
Checklist Procedures	3.7.4.1.3	Checklist procedure shall contain instructions for setup, siting, alignment, operation and teardown.	Appendix VI-B	Demonstrated adequately.

10. Ambient Conditions. The demonstrations were performed in the E-Systems' plant at room temperature.

11. Test Results Analyses. Demonstrations in Appendix VI-A and -C of the Equipment Test Plan met the requirements tested. The following items in Appendix VI-C, safety and human engineering, were noted.

a. Screws on the connector adapter were written up as being too long and creating a safety hazard. This write up resulted from a small cut a technician received in assembling the equipment. Investigation has shown that the cut was not received from a screw on an interface cable connector adapter but from removing a connector cover from a connector. The technician did not grip the cover tightly and allowed his hand to slip on the cover and received the cut. The connector covers are MS27293 type or have been modified with longer steel cables. The possibility of receiving cuts of this kind is very small. Any change to the connector covers to completely remove the possibility of getting cut would require removing the knurled surface and the cover then would be extremely difficult to install and remove.

The length of the screws on the connector adapter were investigated to see if they could be shortened. It was determined that the screw length was as short as possible for proper operation of the clamp on the connector adapter. The length of the screw does not seem to be a significant safety hazard.

b. The ground lug is difficult to tighten by hand and no special tools are available to use. The ground lug on the RT will be changed to a lug that can be tightened by hand.

c. All equipment is awkward to carry in the manportable configuration because the bulk creates an off-balance situation that tends to pull the man backwards. Also, the antenna and ancillary group manportable packages exceed the specified weight.

The RT is packaged in as small a package as possible and is within weight limits and therefore will not be changed. The antenna and ancillary group packages are being redesigned due to problems encountered in the drop tests and effort will be made to get the center of gravity of the packages closer to the packboard to reduce the difficulty in carrying these packages. The weight problems are also being worked on in the redesign of the antenna and ancillary group packages.

12. Certification. Each data sheet shown in Attachment 1 has been signed by Montek engineering and quality assurance representatives and by a DCAS representative certifying that results are authentic, accurate, current and in accordance with related test plans.

ATTACHMENT 1
DATA SHEETS

June 30, 1976 .

DATA SHEET

AIR DROP CONFIGURATION AND CONVERSION TO MANPORTABILITY

AIR DROP CONFIGURATION

RECTANGULAR SHAPE

RECEIVER TRANSMITTER

1-

ANTENNA

1

ANTENNA SUPPORT ASSEMBLY

1

66 x 29 x 48 INCH ENVELOPE

200 7146

CONVERSION TO MANPORTABLE CONFIGURATION

ITEM	TIME	PACK CARRIED
RECEIVER TRANSMITTER	1 min 36 Sec.	sk
ANTENNA	1 min. 54 Sec.	sk
ANTENNA SUPPORT ASSEMBLY	2 min 46 Sec	sk

TECHNICIAN

Paul Dautel

DATE

12/14/76

ENGINEER

Blake D. Doughty

DATE

12/14/76

QA REPRESENTATIVE

Wm 7966

DATE

12-14-76

DCASD

C. H. C. H.

DATE

12 14-76

June 30, 1976

AN/TRN-41 DEMONSTRATION DATA SHEET
ASSEMBLY AND INSTALLATION AND CHECK LIST

System _____

Date 12.14.76

Assembly and Installation Time 5.0 min.

Assembly Check List sk

Operation sk

Checklist sk

Remove and Replace Receiver-Transmitter sk

Checklist sk

Remove and Replace Antenna sk

Checklist sk

Technician Dave Druel

Date 12/14/76

Engineer Blake D. Taylor

Date 12/14/76

QA Representative JM 7966

Date 12.14.76

DCASD C. C. Han

Date 12-14-76

AN/TRN-41 DEMONSTRATION DATA SHEET FOR
SAFETY AND HUMAN ENGINEERING


A.	Carrying Safety	<u>✓</u>	Check *
B.	Stability	<u>✓</u>	Check
C.	Electrical Safety	<u>✓</u>	Check

A.	Carrying Case	<u>✓</u>	Check
B.	Visibility	<u>✓</u>	Check
C.	Switch Operation	<u>✓</u>	Check
D.	Set Up	<u>✓</u> * *	Check

Dame Paula Date 12/15/25

BDO Jorgensen Date 12/15/76

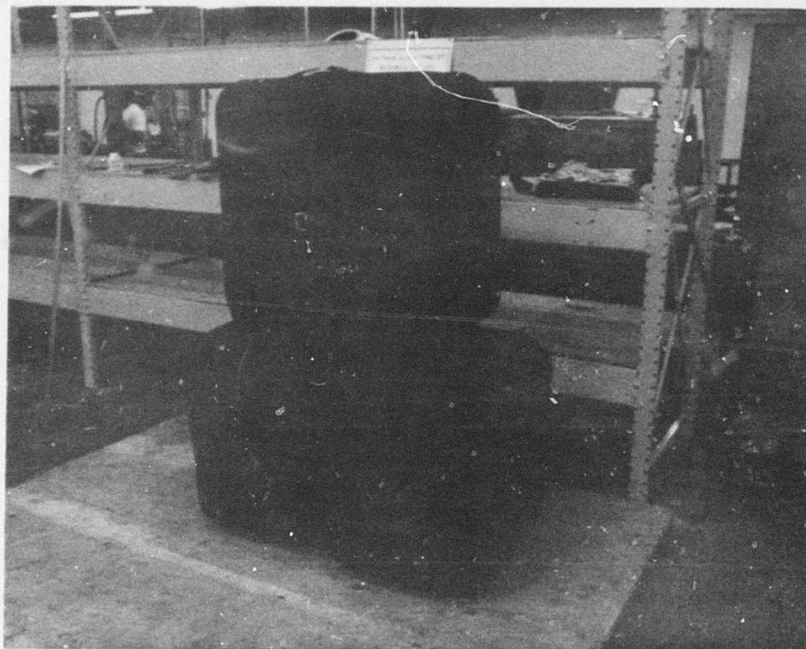
W. M. W. Date 12-15-76

 J. N. Jones Date 12-15-76

* The equipment is awkward to carry in the unportable configuration because the excessive bulk creates an off-balance situation that tends to pull the unit backward. Also, two of the packages exceed 11

THE GROUND LUG IS DIFFICULT TO TIGHTEN BY HAND AND NO SPECIAL TOOLS ARE AVAILABLE TO USE THE GOVERNMENT IS CURRENTLY WORKING TO A DIFFERENT TYPE.

ATTACHMENT 2
PHOTOGRAPHS OF AIRDROPPABLE AND MANPORTABLE CONFIGURATION



AN/TRN-41 IN AIRDROP CONFIGURATION



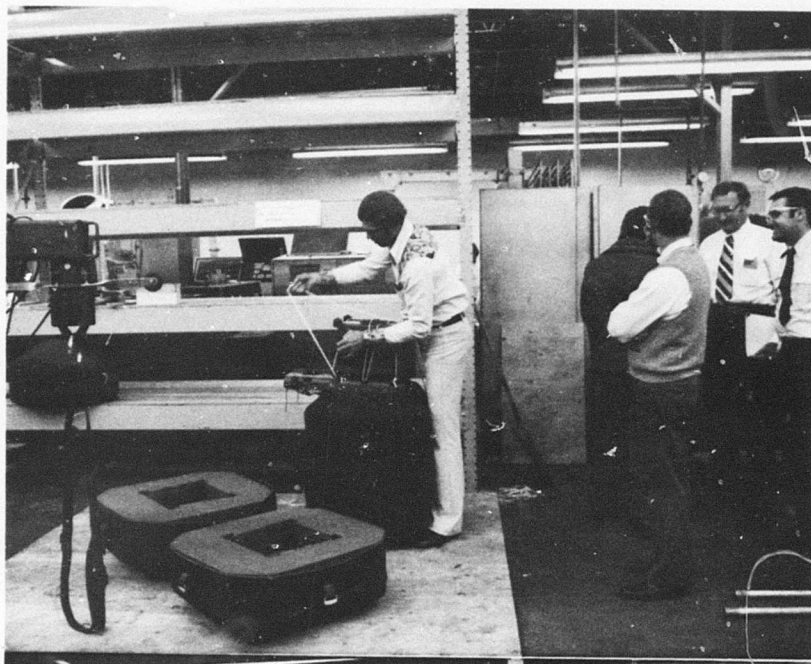
RECEIVER-TRANSMITTER IN MANPORTABLE CONFIGURATION



ANTENNA IN MANPORTABLE CONFIGURATION



ANCILLARY GROUP IN MANPORTABLE CONFIGURATION



RT-1202/T BEING STRAPPED TO PACKBOARD



ANCILLARY MANPORTABLE PACKAGE BEING STRAPPED TO PACKBOARD

ATTACHMENT 3
PHOTOGRAPH OF CHECK LIST OPERATION



AN/TRN-41 CHECKLIST PROCEDURE

ATTACHMENT 4
PHOTOGRAPH OF AN/TRN-41 IN OPEN LOCATION



AN/TRN-41 READY FOR FIELD SETUP



AN/TRN-41 FIELD OPERATIONAL



Supplement 1 for
Report No. 131500-604
12 August 1977

SUPPLEMENT TO
FIELD DEMONSTRATION TEST REPORT
FOR THE
AN/TRN-41 TACAN NAVIGATIONAL SET

Distribution limited to U. S. Government agencies only;
Reason: Test and Evaluation. 12 August 1977. Other
requests for this document must be referred to
Department of the Air Force, Headquarters Electronic
Systems Division (AFSC), Hanscom Air Force Base,
Massachusetts 01731, Attention: PPG.

Prepared for:
Department of the Air Force
Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base
Massachusetts 01731

Prepared by:
E-Systems, Inc., Montek Division
2268 South 3270 West
Salt Lake City, Utah 84119

Contract No. F19628-75-C-0200
CDRL Item A00Y

SUPPLEMENT TO FIELD DEMONSTRATION TEST REPORT
for the
AN/TRN-41 TACAN NAVIGATIONAL SET

This supplement to the field demonstration test report is to describe changes made to the AN/TRN-41 system that affect the field handling of the equipment. The following changes were made.

The backpack was deleted from the antenna and ancillary groups to reduce the weight of these packs. These two groups are in padded containers and carrying straps have been added to the bags making these packs easier to carry and lighter than reported in the initial test report. (See E-Systems' letter 803/7L-2(054), Subject: Weight Reduction Program, dated 26 April 1977, for an analysis of the weight reduction program.) To further reduce weight, the material in the bags was changed from canvas to 2.2 oz. nylon.

Attached are pictures of the antenna and ancillary manportable packs using the nylon bags.

No change in the conversion times from airdroppable to manportable configuration and from manportable configuration to operation was caused by the changes described.



ANTENNA
MANPORTABLE PACK

ANCILLARY
MANPORTABLE PACK



THIS REPORT HAS BEEN DELIMITED
AND CLEARED FOR PUBLIC RELEASE
UNDER DOD DIRECTIVE 5200.20 AND
NO RESTRICTIONS ARE IMPOSED UPON
ITS USE AND DISCLOSURE.

DISTRIBUTION STATEMENT A

APPROVED FOR PUBLIC RELEASE
DISTRIBUTION UNLIMITED.